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| EXAMINER AKANBL ISIAKA O | | | | |
| ART UNIT 2886 | | PAPER NUMBER | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/553,481

Applicant(s)

IMATO ET AL.

Examiner

ISIAKA O. AKANBI

Art Unit

2886

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 October 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/S508)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date _____

DETAILED ACTION

Amendment

The amendment filed on 22 January 2009 has been entered into this application.
Claim 2 is cancelled.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1 and 3-11 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Naya et al. (2002/0140938 A1) in view of Taniura (4,925,271).

Regarding claims 1 and 3, Naya teaches of a differential surface plasmon resonance measuring apparatus comprising:

(a) an incident light optical system (**figs. 1, 13, 14 and 15: 1**), wherein light (**figs. 1, 13, 14 and 15: L1**) enters at an incident angle in a range including the resonance

angle (**resonance angle is considered to be inherent part of the system of (figs. 1, 13, 14 and 15)**)(see abstract)(pars. 0006-0007);

(b) a sample setting device (**figs. 1, 13, 14 and 15: 13**) including a sample solution-fixing portion (**figs. 1, 13, 14 and 15: 15**) and a reference (**reference=a material use or recourse for purposes of information about the sample under examination**) solution-fixing portion align (i.e. to arrange in a straight line; adjust according to a line or to bring into a line or alignment) (**figs. 1, 13, 14 and 15: 30**) on a prism (**figs. 7 and 9: 50**)(pars. 0006, 0168), the sample solution-fixing portion and the reference solution-fixing portion lying in the region irradiated with a beam of the incident light (**pars. 0013, 0147**);

(c) a projection optical system (**figs. 13, 14 and 15: 70**) for splitting light reflected (**beam reflected at an interface 11a**) from the sample solution-fixing portion and the reference solution-fixing portion into respective beams thereof and turning the directions of the beams to project the beams on a single line (**par. 0178**); and

(d) a linear CCD sensor (**photo detector means**) including a CCD on the single line, the CCD receiving the beams (**figs. 1, 13, 14 and 15: 17 and 72**)(pars. 0245, 0247 and 0250).

Naya discloses a projection optical system (**figs. 13, 14 and 15: 70**) for splitting light reflected (**beam reflected at an interface 11a**) from the sample solution-fixing portion and the reference solution-fixing portion into respective beams thereof and turning the directions of the beams to project the beams on a single line (**par. 0178**),

and does not limit the projection optical system to be used that includes other type of beam splitting method.

Naya does not explicitly disclose the type of projection optical system which includes a plurality of mirrors for splitting the light reflected from the sample solution-fixing portion and the reference solution-fixing portion into respective beams thereof and turning the directions of the beams to project the beams on the single line; and wherein the plurality of mirrors include a first mirror for reflecting the reflected light from the sample solution-fixing portion at a first angle and a second mirror for reflecting the reflected light from the reference solution-fixing portion at a second angle.

However, the use of plurality of a plurality of mirrors for splitting reflected or incident light/beam(s) into respective beams thereof and turning the directions of the beams to project the beams on the single line is common and known in the art, as evidenced by **Taniura (figs. 1a and 2a)(col. 1, lines 20-33)**.

Therefore, it would have been at least obvious to one having ordinary skill in the art at the time of invention was made to substitute the Naya projection optical system for the other to achieve the predictable results of splitting the light reflected from the sample solution-fixing portion and the reference solution-fixing portion into respective beams thereof and turning the directions of the beams to project the beams on the single line with accuracy. Additionally, because these two projection optical systems were art-recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute the plurality of mirrors which include a first mirror for reflecting the reflected light from the sample solution-fixing

portion at a first angle and a second mirror for reflecting the reflected light from the reference solution-fixing portion at a second angle for the Naya projection optical system for the purpose of separating light reflected from the sample solution-fixing portion and the reference solution-fixing portion into respective beams thereof and turning the directions of the beams to project the beams on the single line with accuracy.

Further, Naya fails to teach the exact arrangement of the sample setting device such as including a sample solution-fixing portion and a reference solution-fixing portion as been aligned on a thin film deposited on a prism, as that claimed by Applicants. However, the arrangement differences are considered obvious design choices and are not patentable unless unobvious or unexpected results are obtained from these changes. It appears that these changes produce no functional differences and therefore would have been obvious. Note *In re Woodruff* 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Circ. 1990).

Therefore, it would have been at least obvious to one having ordinary skill in the art at the time of invention was made to use as desired appropriate arrangement for the purpose of making the system compact.

As to claim 4, Naya also discloses an optical interface film (**fig. 7 and 9: 56**) with index-matching means (**fig. 7 and 9: 52**) disposed on the prism (**figs. 7 and 9: 50**)(see **abstract**)(**pars. 0038, 0168**); and thus meet the limitation that the an adhesive optical interface film disposed on the prism, the optical interface film having a refractive index matched with the refractive index of the prism.

As to claims 5 and 11, Naya discloses a method for differentially measuring surface plasmon resonance comprising:

emitting light from a light source (**figs. 1, 7 and 9: 2**) having a specific wavelength so as to form a line focus on a sensor including a prism (**figs. 7 and 9: 50**) and a glass substrate (**pars. 0006, 0168**);

a measuring apparatus (figs. 1, 7, 9, 13, 14 and 15) for a surface plasmon resonance sensor for quantitatively analyzing a substance in a sample by utilizing the excitation of surface plasmon, applicant's limitation such as generating surface plasmon resonances at sensing portions of a sample cell and a reference cell that are align (i.e. to arrange in a straight line; adjust according to a line or to bring into a line or alignment) on the line focus at a predetermined distance to reduce the intensity of the light reflected from the sensing portions;

allowing the beams of the reflected light (**beam reflected at an interface 11a**) to reflect from light-splitting mirrors (**figs. 13, 14 and 15: 70**) having different angles with the beams maintaining a distance equal to the predetermined distance between the centers of the sensing portions and thus splitting the reflected light into two optical paths (**figs. 13, 14 and 15: 70-17 and 70-72**); and

pressing an electrode-type combination sensor cell (i.e. **SPR type cell**) that is pressed at a force of about (i.e. **20N**)(**figs. 1, 7, 9, 13, 14 and 15: 10 and 58** including sensing films (**figs. 1, 7, 9, 13, 14 and 15: 12 and 56**) corresponding to the sample portion (**figs. 1, 13, 14 and 15: 15/30**) and the reference portion (**figs. 1, 13, 14 and 15: 15 and 15/30**) on an adhesive optical interface film disposed on the prism (**figs. 1, 7, 9,**

13, 14 and 15: 11 and 50), having a refractive index matched with that of the prism (**figs. 7 and 9: 52**), whereby an optical system performing detection in two regions of a single CCD line sensor measures the surface plasmon resonances generated in the sample cell and the reference cell, with optical matching maintained between the sensor, the optical interface film, and the prism (**see abstract**)(**pars. 0038, 0132, 0168**).

As to claim 6, Naya also discloses optical interface film such as (PMMA) that is a polymeric adhesive optical interface film (par. 0162).

As to claims 7 and 8(6/7), Naya fail to explicitly disclose the type of the polymeric film as comprising polyvinyl chloride; and wherein the sample cell is disposed on the adhesive Optical interface film without using a matching oil having the same refractive index as the prism and the glass substrate.

However, since Naya discloses polymeric film such as (PMMA)(**par. 0162**) that is widely used film, it would have been obvious to one of ordinary skill in the art because these two polymeric film were art-recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute polymeric film such as (PMMA) for polyvinyl chloride to achieve as desired appropriate refractive index such that the polymeric adhesive optical interface film is without using a matching oil having the same refractive index as the prism and the glass substrate for the purpose of measuring with accuracy surface plasmon resonance effect.

As to claims 9 and 10, Naya also discloses a sample cell (**figs. 1, 13, 14 and 15: 13**) with a substance which interactive functional material and refractive index is varied by the interaction which is measured in a chemical sensor-like system; and wherein an

antibody is fixed to the sample cell so that an antigen-antibody reaction is measured in an immunosensor-like system (**pars. 0147-0148**).

Response to Arguments

Applicant's arguments/remarks, see pages 5-7, filed on 22 January, with respect to the rejection(s) of claim(s) 1, 4-6 and 11 under 35 U.S.C. 102(b) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of claim amendment.

In response to Applicant's arguments that the examiner has incorrectly examined the original claims and not the claims as amended during Article 34 amendment because in the Article 34 amendment applicant cancelled claim 2. It is respectfully pointed out to applicant that this argument is not persuasive because the amended limitation of claim 1 during Article 34 amendments is identical/similar to the limitation of claim 2 before the Article 34 amendments which depends on claim 1. In the office action mailed on 22 October 2008, claim 2 was rejected under 35 U.S.C. 103(a) as being unpatentable over Naya et al. (2002/0140938 A1) in view of Taniura (4,925,271).

Further In response to Applicant's arguments:

a) Naya does not provide disclosure for a reference solution fixing portion in addition to a sample solution fixing portion of the sample setting device but only includes a sample solution fixing portion.

b) Naya does not disclose a reference solution-fixing portion in addition to a sample solution-fixing portion-see "a sample solution--fixing portion and a reference solution--fixing portion aligned on a thin film.

c) setting structure of a sample solution and a reference solution corresponding to Claim 1 (b) of the present application is different from that of the Naya apparatus.

d) Naya apparatus only has a half mirror 70 for separating a light beam, and is different from the feature of Claim 1 (c).

e) Taniura does not describe or suggest including a reference solution-fixing portion of the sample-setting device as defined in part (b) of present Claim 1.

f) Taniura relates to a completely different field of research.

g) Naya does not teach simultaneous detection of a test sample and a reference sample, therefore, there would no need to split beams as alleged.

Examiner's response:

with respect to arguments (a)-(d), it is respectfully pointed out to applicant that this argument is not persuasive, as the examiner did recognize that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

With respect to arguments (e)-(f), it is respectfully pointed out to applicant that by applicant's own account the rejection was made as 103 not 102 and the examiner did

recognize that the limitation "a plurality of mirrors for splitting the light reflected from the sample solution-fixing portion and the reference solution-fixing portion into respective beams thereof and turning the directions of the beams to project the beams on the single line; and wherein the plurality of mirrors include a first mirror for reflecting the reflected light from the sample solution-fixing portion at a first angle and a second mirror for reflecting the reflected light from the reference solution-fixing portion at a second angle" was not taught by Naya but used Taniura to find this limitation.

Additionally, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, since both the instant application as disclosed in (par. 0042) and cited reference is reasonably concerned with the projection optical system which includes a plurality of mirrors for splitting incident light, which the applicant is involved, the cited references are considered as an analogous art.

Finally, with respect to argument (g), it is respectfully pointed out to applicant that this argument is not persuasive, as the examiner did recognize that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir.

1988) and In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). As such, the claims are still rejected as shown in the detail above.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Isiaka Akanbi whose telephone number is (571) 272-8658. The examiner can normally be reached on 8:00 a.m. - 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tarifur R. Chowdhury can be reached on (571) 272-2287. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Isiaka Akanbi

April 26, 2009

/TARIFUR R CHOWDHURY/
Supervisory Patent Examiner, Art Unit 2886